

Owlflyes from Jordan (Neuroptera, Ascalaphidae)

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Abstract

The authors publish faunistic data on 48 owlfly specimens from Jordan, where only two species were known in the past. Four species (*Ascalaphus festivus*, *Deleproctophylla variegata*, *Iranoidricerus* cf. *iranensis*, *Stylascalaphus krueperi*) are new records for Jordan and the two previously recorded species (*Bubopsis andromache*, *Bubopsis hamata*) are confirmed. We present an annotated bibliography, the global distribution and information on the life history of each six species. The material reviewed in three collections also provides the first mention of *Deleproctophylla variegata* for Afghanistan.

Key Words

owlfly, ascalaphid, Hashemite Kingdom of Jordan, Iran, Afghanistan, new records, habitat, collecting methods, maturation

Introduction

In the lacewing (Neuroptera) order, the owlfly family (Ascalaphidae) has approximately 450 valid described species. Half of the species described are from tropical and subtropical Africa (Tjeder 1992, Tjeder and Hansson 1992, Oswald 2019). In the Western Palaearctic, the owlfly fauna is well known compared to other regions of the world in terms of taxonomy (Aspöck et al. 2001). In this region, most species are primarily associated with arid semi-desert and desert habitats (Tjeder 1992). The transitional zone of the Afrotropical and Palaearctic regions is also rich in species. In this paper, we follow the traditional classification system for Ascalaphidae proposed by Aspöck et al. (2001). They listed 41 owlfly taxa (Ascalaphinae: 32 species and 4 subspecies, Haplogleniinae: 4 species and 1 subspecies) in their monograph. In recent years, 13 species have been described in the border regions of the Western Palaearctic, namely in Iran (Ábrahám and Mészáros 2002: *Ptyngidricerus pseudoalbardanus*, *P. persepolisensis*, *P. sendanensis* and *P. pakistanensis*), in Pakistan (Mészáros and Ábrahám 2005: *Stylascalaphus fabiani*), on the Arabian Peninsula (Hölzel 2004: *Tytomy-*

ia arabica, *Mansellacsa longicornis*, *Disparomitus yemenicus*, *Dixonotus hackeri*, *Aspoeckiella gallagheri* and *A. hyalina*) and in Morocco (Ábrahám 2010: *Cirroproctophylla berbericus*; Badano and Pantaleoni 2012: *Agadirius trojani*). One previously recorded species (*Ascalaphus hyalinus* (Navás, 1921) (sic!)) proved to be a synonym of *Stylascalaphus krueperi* (van der Weele, 1909) (Ábrahám 2017). The owlfly fauna of the Western Palaearctic merits further research, as taxonomic uncertainties remain and the distribution of species needs to be mapped.

Jordan is located in the Middle East at the intersection of different biogeographic provinces (Udvardy 1975). Various climatic regimes, ranging from subhumid to arid Mediterranean and Saharan-Mediterranean bioclimates, as well as four phytogeographic regions, Mediterranean, Irano-Turanian, Saharo-Arabian and Sudanian, are described (Al-Eisawi 1996). In Jordan, only two species (*Bubopsis andromache* and *Bubopsis hamata*) were known from the literature (Aspöck U. et al. 1979, Dobosz and Ábrahám 2007). The authors gathered new and mainly recent data on the Jordanian owlfly fauna from two museum collections and from material gathered by the first author on recent collecting trips.

Material and methods

Between 2007 and 2015, the first author conducted ten field trips to Jordan at different periods of the year. Trips were undertaken in January (1), April (3), May (1), June (2), August (1), November (1) and December (3). Although those entomological trips mainly focused on dragonflies and were thus largely conducted in aquatic habitats, attention was always paid to neuropterans and many other diverse habitats were visited. Except for one individual, owlflies were collected during the day. Two portable light traps (12V super actinic, model bioform.de) powered by a car battery were used in June 2011 and May–June 2012.

The categories defined for vegetation and climatic regions come from Al-Eisawi (1996), whereas the reference used for the flora is that of Zohary (1966–1972) and considering the update of Danin (2004).

Habitus photographs were taken using a digital camera Canon EOS 6D coupled with VISIONARY DIGITAL PASSPORT and HELICON FOCUS version 5.3 in order to compile the pictures.

Abbreviations

Chlist – Checklist, Comb – New combination, Dist – Distribution, Larva descr – Larva description, Mon – Monograph, Odescr – Original description, Rdescr – Redescription, Syn – Synonym, Com – Comment

CCM	Private Collection, Christian Monnerat, Neuchâtel (Switzerland);
MHNG	Natural History Museum of Geneva (Switzerland);
SCMK	Rippl-Rónai Museum, Kaposvár (Hungary)

Results

Only two species of owlflies had previously been observed in Jordan. The authors were able to record four more species from the area. According to the distribution of the species, one (*Ascalaphus festivus*) comes from the Afrotropical region. Three species (*Stylascalaphus krueperi*, *Bubopsis andromache*, *Deleproctophylla variegata*) are present in the Mediterranean region, while two species (*Bubopsis hamata*, *Iranoidricerus* cf. *iranensis*) were found in Asian eremic regions. The diversity of the fauna is reflected in the location of the country, as it lies in the south-eastern part of the Western Palaearctic, in an area where three distinct biogeographic provinces intersect.

The authors provide an annotated bibliography of species, faunistic data, species distributions and some biological features below.

Ascalaphidae Lefébvre, 1842

Ascalaphinae Lefébvre, 1842

Ascalaphus festivus (Rambur, 1842)

Figs 1–4

Bubo festivus Rambur, 1842 – (ODeskr), Navás 1913b (Tax, Dist).

Ascalaphus festivus (Rambur, 1842) – Walker 1853 (Nom), Hagen 1866 (Tax), Tjeder 1972 (Nom), 1980 (Tax, Dist), Ohm and Hölzel 1982 (Dist), Hölzel 1983 (Tax, Dist), 1998 (Dist), 2004 (Dist), Hölzel and Ohm 1990 (Dist), Aspöck and Hölzel 1996 (Chlist), Schacht 2000 (Dist), 2002 (Dist), Sziráki 1998 (Chlist), 2010 (Dist), Gillette 1999 (Dist), Whittington 2002 (Dist), Güsten 2003 (Dist), Monserrat and Martín 2005 (Dist), Ábrahám and Dobosz 2011 (Dist), Aistleitner and Hölzel 2012 (Dist), Pantaleoni et al. 2013 (Dist), Prost 2013 (Tax, Dist), Badano and Pantaleoni 2014 (Larva descr).

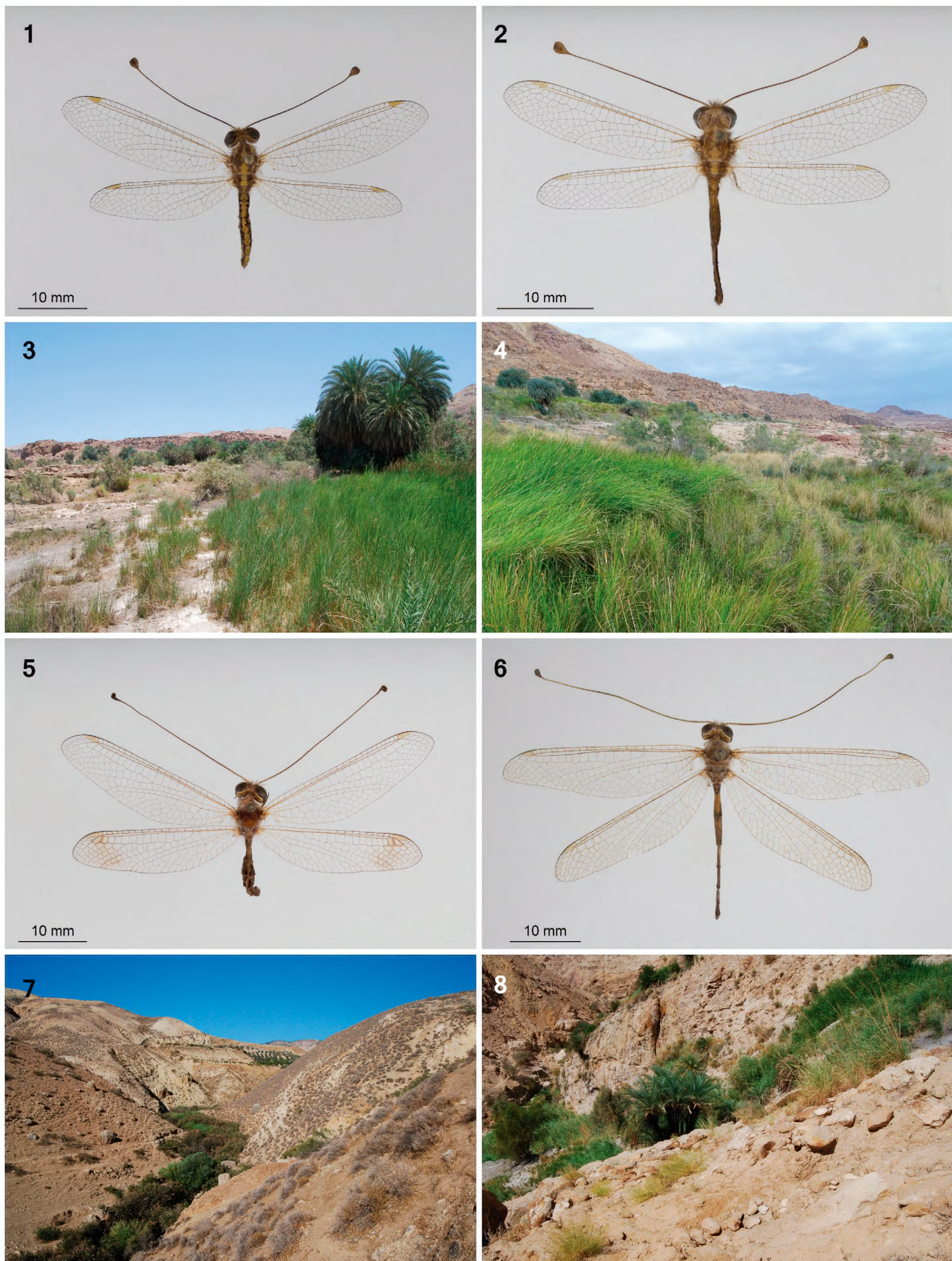
Encyoposis (?) *festivus* (Rambur, 1842) – McLachlan 1873 (Nom).

Helicomitus festivus (Rambur, 1842) – Van der Weele 1909a (Dist), 1909b (Mon), Klapálek 1912 (Dist), Navás 1912a (Dist), 1912b (Chlist), 1913a (Dist), 1914 (Dist), 1915 (Dist), 1919 (Dist), 1924 (Dist), 1925a (Dist), 1925b (Dist), 1926a (Dist), 1927 (Dist), 1928 (Dist), 1929 (Dist), 1930 (Dist), 1930–1931 (Dist), 1931a (Dist), 1931b (Dist), 1931c (Dist), 1933 (Dist), 1934 (Dist), 1936 (Dist), Banks 1930 (Dist), 1938 (Dist), Kimmins 1939 (Dist), 1949 (Rdescr, Dist), 1950 (Dist), Fraser 1951a (List), 1951b (Dist), Handschin and Markl 1955 (Dist).

Material examined. 1♀, Jordanien, Cumran a. Toten Meer, 16.x.1966, leg. J. and S. Klapperich, MHNG; 1♂, Jordania Jordan, Oberes Jordantal, vi.1999, leg. G. Müller, SCMK;

1♀, 7.75 km N Wadi Mujib mouth, 31.53664N, 35.56176E, 315 m u.s.l., 3.viii.2009, leg. C. Monnerat, CCM; 1♂, 7.75 km N Wadi Mujib mouth, 31.53705N, 35.56141E, 320 m u.s.l., 4.viii.2009, leg. C. Monnerat, CCM; 3♂♂, 3♀♀, 7.75 km N Wadi Mujib mouth, 31.53681N, 35.56125E, 330 m u.s.l., 12.vi.2011, leg. C. Monnerat, CCM (Figs 1, 2); 3♂♂, 1♀, 7.75 km N Wadi Mujib mouth, 31.53671N, 35.56131E, 320 m u.s.l., 4.vi.2012, leg. M. Borer, CCM.

Distribution. This species is widely distributed in Africa. According to Prost (2013) it is found in the Republic of South Africa, West Africa (Chad, Niger, Burkina Faso, Mali, Senegal, Ghana and Liberia) and on the northern coast of Africa. Pantaleoni et al. (2013) published surprising records from southern Sardinia (Italy). Aspöck et al. (2001) documented the species on the border region of Southwest Palaearctic (Israel, Saudi Arabia, Oman, Yemen, the United Arab Emirates, Tunisia and the Cape Verde Islands). Its occurrence in Egypt (Navás 1913) was confirmed by Prost (2013). It is a new record for the fauna of Jordan. Further specimens can be found in the collection of SCMK (Kaposvár) from Namibia, Zambia, Tanzania, Kenya and Ethiopia. A closely related taxon from Madagascar is treated by Tjeder (1980) and Prost (2013) as a separate species



Figures 1–8. 1. Habitus of *Ascalaphus festivus* female. 2. Habitus of *A. festivus* male. 3. Habitat of *A. festivus* near the Dead Sea, August 2009. 4. Habitat of *A. festivus* near the Dead Sea, December 2015. 5. Habitus of *Stylascalaphus krueperi* female. 6. Habitus of *S. krueperi* male. 7. Habitat of *S. krueperi*, Wadi Kufrinja Valley, August 2009. 8. Habitat of *S. krueperi*, Wadi Afra Valley, August 2009. Pictures: all C. Monnerat.

under the name *Ascalaphus africanus* (McLachlan, 1871), which is also mentioned from Mozambique (Prost 2013). In the future, it would be worthwhile to confirm morphologically separated species by genetic testing.

Comments. This species was found in a marsh near a hot spring and local water seeps. The vegetation was characterized by scattered date palms (*Phoenix dactylifera*) and covered with *Juncus* and *Saccharum* (Figs 3, 4). Males and females were found during the day sitting on stems and collected with insect nets. The locality to the north of Wadi Mujib near the Dead Sea is the lowest observation point on earth for this species at 316 m b.s.l. and is located in the Sudanian bioclimatic region characterized by tropical influences. The species was found in Oman and Saudi Arabia near wadis, in their flood plains, or in oases (C. Monnerat, personal observation). In Sardinia, *A. festivus* is found in coastal salt marshes (Pantaleoni et al. 2013).

Stylascalaphus krueperi (Van der Weele, [1909b])

Figs 5–8

Helicomitus krüperi Van der Weele, 1909b (ODEscr).

Ascalaphus krueperi (Van der Weele, 1909b) – Aspöck, H. and Hölzel 1996 (Dist), Aspöck et al. 2001 (Mon), Sziráki 1998 (Chlist).

Helicomitus hya[t]inus Navás, 1921 (sic!) (ODEscr).

Ascalaphus hyatinus (Navás, 1921) – Aspöck, H. and Hölzel 1996 (Comb, Dist), Aspöck et al. 2001 (Mon), Ábrahám 2010 (Dist, Com).

Stylascalaphus krueperi (Van der Weele, [1909b]) – Ábrahám 2017 (Tax, Rdescr, Dist).

Material examined. 1♀, Wadi Kufrinja Valley, 2.9 km E Kurayyima, 32.26954N, 35.62977E, 20 m a.s.l., 6.viii.2009, leg. C. Monnerat, CCM (Fig. 5); 1♂, Hammamat Afra–Burbeita, 16.4 km SEE al Safi, 30.97796N, 35.64034E, 230 m a.s.l., 17.viii.2009, leg. C. Monnerat, CCM (Fig. 6).

Distribution. Information on the taxonomic status and distribution of this species, with new records for Morocco, was recently published by Ábrahám (2017). This species represents a new record for the fauna of Jordan.

Comments. The habitat in Wadi Kufrinja Valley (Fig. 7) was a pasture on the left flank of a steep-sided valley with low bushes, stones and some rocky outcroppings. There was grazing pressure from sheep and goats. The individual was disturbed, flew off and was later found again, with some difficulty because it was flying quickly, sitting on dry bush stems (Lamiaceae). At Hammamat Afra–Burbeita, a male was found sitting on the dry stem of an annual plant (Asteraceae) on a dry, sandy, rocky slope in Wadi Afra Valley near a strip of marsh (Fig. 8).

Bubopsis andromache Aspöck, Aspöck & Hölzel, 1979

Figs 9–14

Bubopsis andromache U. Aspöck, H. Aspöck and Hölzel 1979 – (ODEscr), Aspöck et al. 1980 (Mon), 2001 (Mon), Pieper and Willmann

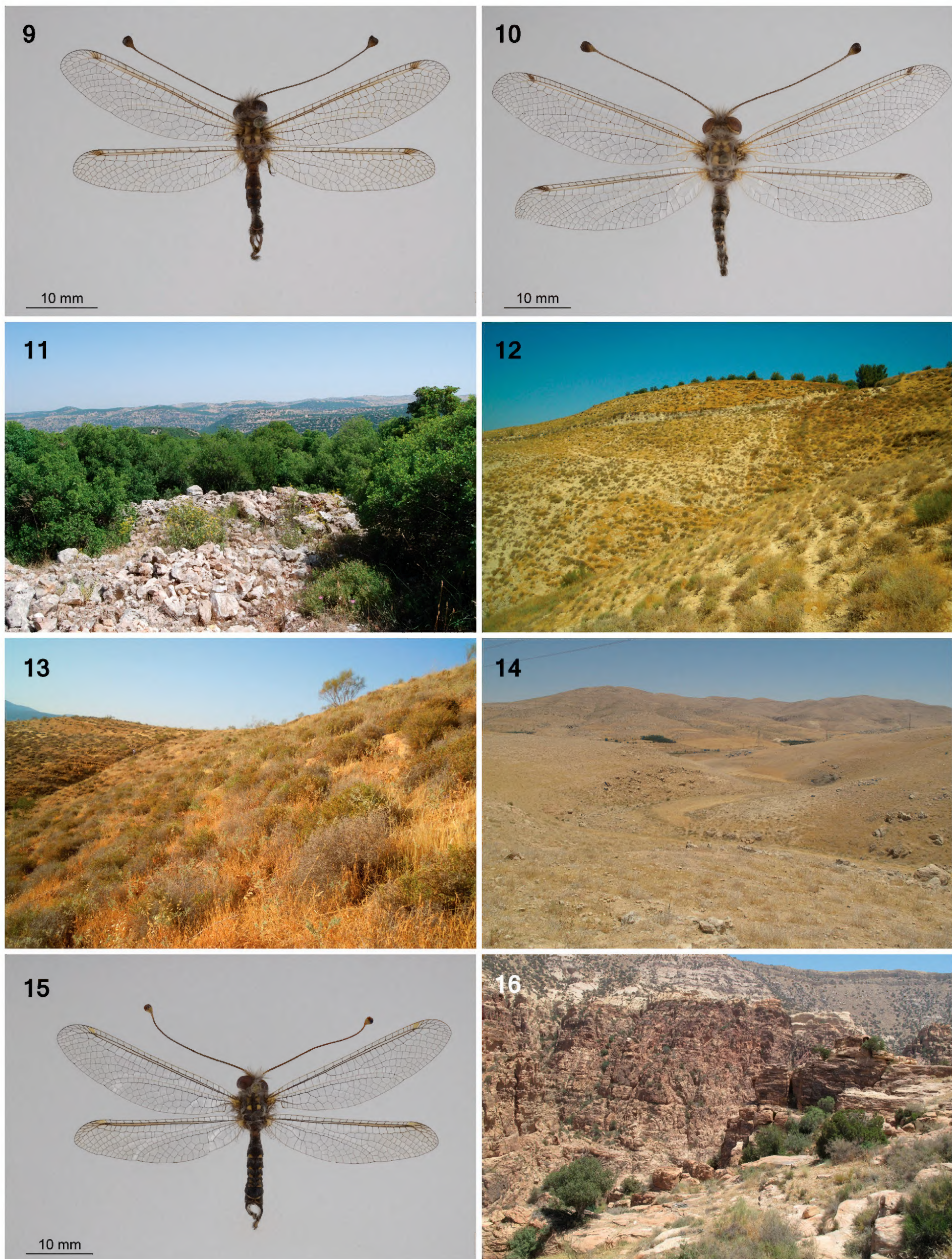
1980 (Larva descr), Aspöck H. and Hölzel 1996 (Chlist), Letardi 1991 (Dist), Sziráki 1998 (Chlist), Popov, 2004 (Dist), Canbulat 2007 (Chlist), Dobosz and Ábrahám 2007 (Dist).

Bubopsis andromache firyuzae Sziráki, 2000 – (ODEscr).

Material examined. 1♂, Ajlun Reserve, RSCN Lodge, 32.38037N, 35.76356E, 1015 m a.s.l., 9.vi.2011, leg. C. Monnerat, CCM; 1♂, Ajlun Reserve, 32.38140N, 35.76403E, 1020 m a.s.l., 10.vi.2011, leg. C. Monnerat, CCM (Fig. 9); 1♀, 9.5 km W Madaba, 31.72070N, 35.69316E, 520 m a.s.l., 26.v.2012, leg. M. Borer, CCM (Fig. 10); 1♂, Dar al-Basha, 32.63274N, 35.71241E, 260 m a.s.l., 1.vi.2012, leg. M. Borer, CCM; 2♀♀, Wadi Zarqa, 32.16718N, 36.00473E, 465 m a.s.l., 3.vi.2012, leg. C. Monnerat, CCM; 1♀, ar-Rumman, 32.18935N, 35.84772E, 365 m a.s.l., 3.vi.2012, leg. C. Monnerat, CCM; 1♀, Jordan, Jarash Burma env., Al Huna, 15.v.2016, leg. Snizek, SCMK.

Distribution. The first specimens of *Bubopsis andromache* were collected by Werner from Samos (Werner 1934), Limnos (Werner 1937) and Lesvos (Werner 1938) before the species was described. Werner published these specimens under the name *Bubopsis hamata*, as reported by Popov (2004). This species is found in Greece, northern Macedonia, southwestern Bulgaria, the Aegean Islands (Crete and Gavdhos, Lesvos, Samos, Kalimnos, Kos and Rhodes), western and southern Asia minor and the eastern Mediterranean region (Israel, Syria, Lebanon) (Aspöck et al. 2001). In Turkey it was collected mainly near the coast. Its occurrence in Jordan was also mentioned by Dobosz and Ábrahám (2007). The subspecies *Bubopsis andromache firyuzae* Sziráki, 2000 is only known from southern Turkmenistan.

Comments. For the most part, species of the genus *Bubopsis* are typical hilltopping species that fly before sunset and are attracted to light traps after evening twilight. In the morning it may still be found but less frequently. Yet nearly all the specimens were collected with an entomological net during the day (morning, midday, afternoon), often after being disturbed from rest. Two specimens, however, were attracted by light trap or by building lights (RSCN lodge at Ajlun Reserve). The species was recorded in different habitats, including semi-closed forest (Fig. 11) and open field (Fig. 14). At Ajlun RSCN Reserve, it was found in clearings of *Quercus* sp. forest with *Pistacia palaestina* and *Arbutus andrachne*, small bushes of *Cistus creticus* (Fig. 11), occasionally sitting on dry shrub stems of *Phlomis viscosa*. At ar-Rumman, it was found in open landscape with bushes of *Retama raetam* and Mediterranean Batha vegetation with *Sarcopoterium spinosum*, *Phagnalon rupestre* (Fig. 13) or in still drier habitat without shrubs and mostly with annual herbs, such as in fallow fields (Fig. 14). The species was recorded in the western highlands (northern and central parts) of Jordan between 260 and 1020 m a.s.l., from subhumid to arid Mediterranean bioclimates in Mediterranean and Irano-Turanian vegetation zones.



Figures 9–16. **9.** Habitus of *Bubopsis andromache* male (Picture: C. Monnerat). **10.** Habitus of *B. andromache* female (Picture: C. Monnerat). **11.** Habitat of *B. andromache*, Ajlun RSCN Reserve, Jordan, June 2011 (Picture: C. Monnerat). **12.** Habitat *B. andromache*, Dar al-Basha, June 2011 (Picture: C. Monnerat). **13.** Habitat *B. andromache*, ar-Rumman, June 2012 (Picture: C. Monnerat). **14.** Habitat of *B. andromache*, Wadi Zarqa Valley, June 2012 (Picture: Matthias Borer). **15.** Habitus of *Bubopsis hamata* male (Picture: C. Monnerat). **16.** Habitat of *B. hamata*, Dana RSCN Reserve, Jordan, June 2011 (Picture: Matthias Borer).

***Bubopsis hamata* Klug, 1834**

Figs 15, 16

Ascalaphus hamatus Klug, 1834 – (Odescr), Walker 1853 (Rdescr, Tax, Dist), Hagen 1863 (Dist), 1866 (Tax), Navás 1910 (Dist).

Bubo hamatus (Klug, 1834) – Rambur 1842 (Tax, Rdescr, Dist), Hagen 1860 (Tax, Comb), McLachlan 1871 (Tax), Klapálek 1906 (Dist).

Ascalaphus forcipatus Eversmann, 1850 – (Odescr), Hagen 1866 (Tax), McLachlan 1873 (Tax), Van der Weele 1909b (Syn).

Bubopsis hamatus (Klug, 1834) – Van der Weele 1909b (Mon), Navás 1911 (Dist), 1912b (Mon), 1925b (Dist), 1926b (Dist), Morton 1925 (Dist), Alexandrov-Martynov 1926 (Dist), Bodenheimer 1937 (Dist), Kimmins 1938 (List), Aspöck U. et al. 1979 (Tax, Dist), Şengonca 1979 (Chlist), Hölzel 1983 (Tax, Dist), 1998 (Dist), 2004 (Dist), Aspöck, H. 1992 (Dist), Luppova 1973 (Dist), 1987 (Dist), Aspöck H. and Hölzel 1996 (Dist), Sziráki 1998 (Chlist), 2000 (Dist), Howarth and Aspinall 2002 (Dist), Koçak and Kemal 2002 (Dist), Mirmoayed 2002 (Dist), Whittington 2002 (Dist), Canbulat and Kiyak 2005 (Dist), Ari et al. 2008 (Dist), El-Hamouly and Hassan 2011 (Dist), Ilyina et al. 2013 (Dist), Krivokhatsky et al. 2015 (Dist).

Material examined. 1♂, Dana RSCN Reserve, 30.67809N, 35.5988E, 850 m a.s.l., 4.vi.2011, leg. C. Monnerat, CCM (Fig. 15).

Distribution. Its distribution likely extends from northeastern Africa (Egypt) to West Asia (Iran, Iraq, Syria, Israel, Jordan, Saudi Arabia) (Hölzel 2004). In Turkey, observations suggest that this species is only found in the eastern part of the country (Dobosz and Ábrahám 2007). It is also known from the Caucasus (Azerbaijan, Georgia) and Kopet Dag Mountains (Turkmenistan, Kyrgyzstan). The type locality is in Syria (Van der Weele 1909).

Comments. In Jordan, the specimen found in Dana (Fig. 16) was sitting on a bush of *Retama raetam* in the late afternoon (17:25 UTC) on a dry, rocky slope. The area has a quick vegetation transition from Mediterranean to Irano-Turanian.

***Deleproctophylla variegata* (Klug in Ehrenberg, 1834)**

Figs 17–23

Ascalaphus variegatus Klug, 1834 – (Odescr), Walker 1953 (Mon), Hagen 1860 (List), 1866 (Tax), McLachlan 1873 (Tax), Navás 1912b (Mon), Alexandrov-Martynov 1926 (Dist), Aspöck et al. 1980 (Mon).

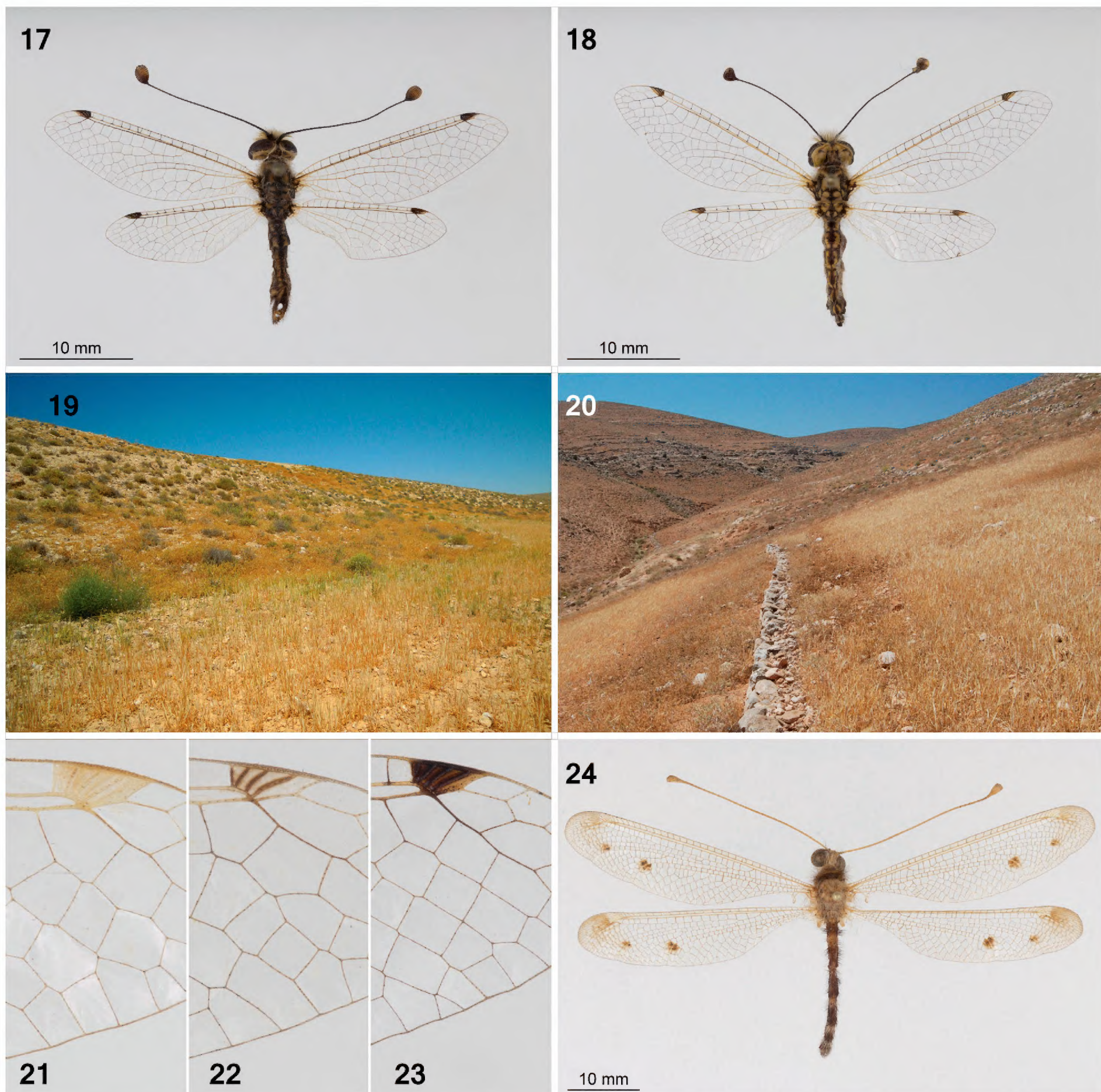
Theleproctophylla barbara auct.(nec Linnaeus) – Navás 1909 (Dist), 1910 (Dist), 1925b (Dist), 1929 (Dist), Bodenheimer, F. S. 1937 (Dist).

Deleproctophylla variegata (Klug, 1834) – Scott 1929 (Dist), Luppova 1973 (Dist), 1966 (Dist), Aspöck et al. 1980 (Mon), Letardi 1991 (Dist), Aspöck and Hölzel 1996 (Chlist), Kačirek 1998 (Dist), Sziráki 2000 (Dist), 2010 (Dist), Háva 2000 (Dist), Koçak and Kemal 2002 (Dist), Whittington 2002 (Dist), Canbulat and Kiyak 2005 (Dist), Canbulat 2007 (Chlist), Dobosz and Ábrahám 2007 (Dist), Krivokhatsky et al. 2015 (Dist).

Material examined. 1♂ Jordania Jordan, Oberes Jordantal, vi.1999, leg. G. Müller, SCMK; 1♂, 1♀, Ayy Alhizman (al-Hazman), 31.11650N, 35.63200E, 1145 m a.s.l., 2.vi.2011, leg. M. Borer, CCM; 2♂♂, NW Wadi Zarqa, 32°11'31.4"N, 36°00'23.2"E, 540 m a.s.l., 8.vi.2011, leg. M. Borer, CCM (Fig. 17); 1♀, 1.2 km NE Sakhra, 32.37790N, 35.85935E, 1005 m a.s.l., 9.vi.2011, leg. C. Monnerat, CCM; 2♂♂, 1♀, dir. al-'Aluk, 32.18888N, 35.98066E, 520 m a.s.l., 11.vi.2011, leg. C. Monnerat, CCM; 1♂, 3♀♀, 9.5 km W of Madaba, 31.72070N, 35.69316E, 520 m a.s.l., 26.v.2012, leg. C. Monnerat, CCM (Figs 18, 22–23); 1♂, 3♀♀, 9.5 km W of Madaba, 31.72070N, 35.69316E, 520 m a.s.l., 26.v.2012, leg. M. Borer, CCM (Fig. 21); 1♀, 3.vi.2012, Wadi Zarqa, 32.16718N, 36.00473E, 465 m a.s.l., leg. C. Monnerat, CCM; 2♀♀, 3.vi.2012, ar-Rumman, 32.18978N, 35.85004E, 430 m a.s.l., leg. C. Monnerat, CCM; 1♀, 8.vi.2012, between Libb and Muqawir, 31.59344N, 35.68667E, 710 m a.s.l., leg. C. Monnerat, CCM.

Distribution. The first described *Deleproctophylla* species was *Deleproctophylla variegata* (Klug, 1834), known mainly from the West Palaearctic (Europe: Greece (Chios), Asia: Cyprus, Turkey, Caucasus region (Aspöck et al. 2001), Irak (Kurdistan) (Scott 1929), Lebanon (type locality), Israel, Turkmenistan, Uzbekistan (Alexandrov-Martynov 1926), Kyrgyzstan (Krivokhatsky et al. 2015), Iran (Hamadan; SCMK, unpublished data) and Afghanistan (Upper Silesian Museum, Poland, unpublished data)). It is a new record for the fauna of Jordan. There are false distribution records in Navás's (1912b) monograph from Spain and France that were corrected in the monograph of Monserrat et al. (2012).

Comments. It is a day-active species found in open landscapes, for example in extensive cereal fields of *Triticum dicoccoides* (Figs 19, 20) and fallow fields with *Erucaria hispanica*. *D. variegata* is distributed in Jordan in the north and central part of the western highlands area between 430 and 1145 m a.s.l. in semiarid and arid Mediterranean bioclimates. The pterostigma of the specimens collected near Madaba on 26.v.2012 exhibited a gradient of color ranging from beige to light brown to dark brown (Figs 21–23), due to maturation processes. Such differences in wing cell coloration were the cause of confusion in the systematics of *Deleproctophylla*, for example between *D. dusmeti* (Navás, 1914) and *D. bleusei* Kimmins, 1949, as detailed in Monserrat et al. (2014). In mature specimens of *D. bleusei*, the pterostigma are whitish to bright yellowish, whereas in *D. dusmeti* the pterostigma are darker. However, other identification criteria such as the wingspot pattern and the morphology of the genitalia are diagnostic and the pterostigma of mature specimens of *D. bleusei* are whitish to bright yellowish.



Figures 17–24. 17. Habitus of *Deleproctophylla variegata* male. 18. Habitus of *D. variegata* female. 19. Habitat of *D. variegata*, Alhizman, June 2011. 20. Habitat of *D. variegata*, Wadi Zarqa Valley, June 2011. 21. *D. variegata*, pterostigma of right forewing, MONNECH01_004933. 22. *D. variegata*, pterostigma of right forewing, MONNECH01_004922. 23. *D. variegata*, pterostigma of right forewing, MONNECH01_004921. 24. Habitus of *Iranoidricerus cf. iranensis* male. Pictures: all C. Monnerat.

Haplogleniinae Newman, 1853

Iranoidricerus cf. iranensis (Kimmins, 1938)

Fig. 24

Ptyngidricerus iranensis Kimmins, 1938 – (ODescr), Tjeder and Waterston 1977 (Tax), Aspöck H. and Hölzel 1996 (Chlist), Sziráki 1998 (Chlist), Aspöck et al. 2001 (Mon).

Iranoidricerus iranensis (Kimmins, 1938) – Ábrahám and Mészáros 2002 (Tax), Kemal and Kocak 2006 (Dist), Canbulat 2007 (Chlist), Dobosz and Ábrahám 2007 (Dist), Kemal and Seven 2011 (Dist), Zamani et al. 2019 (Dist, Tax).

Material examined. 1♂, Jordanien, Romana, Ost-Jordanien, 4.x.1966, leg J. and S. Klapperich, MHNG (Fig. 24); 1♀, Jordania, near Amman, 1000 m a.s.l., vii.1999, leg. G. Müller, SCMK.

Distribution. Information on the general distribution of this species was published by Ábrahám and Mészáros (2002) and additional data were found in Kemal and Kocak (2006) and Kemal and Seven (2011) for Turkey and Zamani et al. (2019) for Iran. A severely damaged specimen examined by Tjeder with a label “Palestine” considered as questionable referred most probably to this species (Tjeder and Waterston 1977). The specimens examined

represent new records for the fauna of Jordan. This species is distributed in the mountainous areas from south-eastern Turkey (from 1000 to 1200 m a.s.l.) to western Iran (from 1141 to 2582 m a.s.l.) with a southern disjunct area in Jordan and probably also in neighbouring Palestine.

Comments. While no information is available on the collection method used by the Klapperichs, Müller’s specimen was collected by light trapping, as were other specimens (Kemal and Koçak 2006, Kemal and Seven 2011, L. Ábrahám, personal observations). Additional individuals were found by the first author in the Insect Museum at the University of Jordan (Amman) from the area around Amman in Irak al-Amir and as-Salt. Localities are situated in the mountainous area from 800 to 1000 m a.s.l. in a semiarid Mediterranean bioclimate.

Discussion

The owlfly fauna of Jordan is at present better understood, with six known species in comparison to the two species previously mentioned in the literature (Aspöck et al. 1979, Aspöck et al. 2001, Dobosz and Ábrahám 2007). However, given its four climatic influences (Al-Eisawi 1996), Jordan has a wide diversity of habitats that should be studied more carefully to improve our understanding of the biology, ecology and distribution of these fascinating insects. Species recorded from neighbouring countries (Tab. 1), such as *Libelloides syriacus* (McLachlan, 1871) and *Puer maculatus* (Olivier, 1789) in Israel, are also potentially present in Jordan, namely in regions with Mediterranean climatic influences. Some species known from the Arabian Peninsula (Oman, Saudi Arabia, United Arab Emirates, Yemen) may also be found, possibly in southern Jordan, where no records are thus far available from large areas such as Wadi Araba, Wadi Rum and the eastern desert. This region is identified as a transition zone between the Palaearctic and Eremic fauna detailed by Por (1975). The Arabian Peninsula has been better explored recently, resulting in the description of several

species (Hölzel 2004). Nevertheless, the fauna of Saudi Arabia, which shares large borders with Jordan in the south and the east, remains poorly known. The presence of *Ascalaphus festivus* confirms a relatively large zone of overlap of the afro-tropical faunistic region with the western Palaearctic region, as is the case for *Palpares cephalotes*, distributed from Afghanistan to Senegal. Its presence suggests that other species from the afro-tropical faunistic region may also eventually be found. Light trapping, especially if conducted shortly after twilight, in combination with sight hunting during the day, may maximize the number of species observed.

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Table 1. List of Ascalaphidae recorded in Jordan and the neighbouring countries. x = before 2000, X = from 2000, bold = new records, ? = uncertain.

Species	Israel	Lebanon	Palestine	Jordan	Syria	Saudi Arabia	Irak
<i>Ascalaphus festivus</i>	X		x	X		x	
<i>Ascalaphus dicax</i>		?					?
<i>Bubopsis andromache</i>	X	x		X	x		
<i>Bubopsis hamata</i>	x			X	X	x	x
<i>Deleproctophylla variegata</i>	x			X	X		
<i>Iranoidricerus cf. iranensis</i>			?	X			
<i>Libelloides macaronius</i>	x	x					
<i>Libelloides rhomboideus</i>	x						
<i>Libelloides syriacus</i>	x						
<i>Ptyngidricerus albardanus</i>							x
<i>Puer maculatus</i>	x						
<i>Stylascalaphus krueperi</i>				X	x		
<i>Tmesibasis larseni</i>						x	

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